澳門特別行政區 REGIÃO ADMINISTRATIVA ESPECIAL DE MACAU





AERONAUTICAL CIRCULAR CIVIL AVIATION AUTHORITY – MACAO, CHINA

SUBJECT:

ATS Requirements

EFFECTIVE DATE:

15 November 2020

CANCELLATION:

AC/ATS/003R04

GENERAL:

The President of Civil Aviation Authority – Macao, China, in exercise of his power under Paragraph 89 of the Air Navigation Regulation of Macao (ANRM) and Article 35 of the Statutes of Civil Aviation Authority, approved by the Decree-Law 10/91/M, established this Aeronautical Circular (AC).

1 Purpose

The purpose of this AC is to establish the air traffic services requirements in accordance with ICAO Standards and Recommended Practices. The detailed requirements are prescribed in Appendix A of this AC, titled as ATS Requirements.

2 Applicability

The requirements contained in this AC are applicable to air traffic services being provided to aircraft operating within Macao Air Traffic Zone.

3 Document change record of ATS Requirements

The complete history of the ATS Requirements in Appendix A to this AC is shown in the following table.

AC No. : AC/ATS/003R05 Date : 30 October 2020

Issue	Revision	Date	Subject	Pages
				affected
1	0	15/02/2009	Initial issue	All
1	1	01/04/2012	-Establishment and Identification	2-4
			of Significant points	
			-Safety Management	2-8
			-Principles Governing the	A3-1
			Establishment and Identification	
			of Significant Points	
1	2	01/11/2012	-Amendment to a definition	1-1
			-Coordination of activities	2-4 & 2-5
			potentially hazardous to civil	
			aircraft	
			-(QMS) the use of automation	2-6 & 2-7
			enabling digital data exchange	
			-Use of fully automatic observing	4-1 & A2-1
			systems for the provision of local	
			reports;	
1	3	01/01/2014	-Amendment to definitions	1-1
			-Integrity of aeronautical data	2-6
			-Safety management system	2-11
			-Identification and delineation of	2-11 & 2-12
			prohibited, restricted and danger	
			areas	
			-Aeronautical data quality	A2-1 & A2-2
			requirements	
1	4	01/05/2020	-Establishment and identification	2-4
			of significant points	
			-Aeronautical data	2-6
			-Coordination between	2-7
			aeronautical information services	
			and air traffic services units	
			-Principles governing the	A2-1 to A2-5
			establishment and identification	
			of significant points	
1	5	15/11/2020	-Coordination of activities	2-5 & 2-6
			potentially hazardous to civil	
			aircraft	

AC No. : AC/ATS/003R05 Date : 30 October 2020

	-Safety management	2-10
	-Air traffic control clearances	3-5
	-END-	

AC No. : AC/ATS/003R05 Date : 30 October 2020

Appendix A

ATS Requirements

Issue 1. Rev 5

澳門特別行政區 REGIÃO ADMINISTRATIVA ESPECIAL DE MACAU



Air Traffic Services Requirements

Issue 1. Rev. 5

Preface

The requirements contained in this document are applicable to air traffic services. The air traffic services provider shall meet the requirements in order to ensure that those services are safe for use by aircraft and meet the ICAO Standards and Recommended Practices.

Table of Contents

Preface		ii
Table of C	ontents	iii
Document	Change History	vi
Checklist of	of Pages	vii
Chapter 1	Definitions	1-1
Chapter 2	General	2-1
1.	Objectives of the air traffic services	2-1
2.	Divisions of the air traffic services	2-1
3.	Determination of the need for air traffic services	2-1
4.	Designation of the portions of the airspace and controlled aerodromes where air traffic services will be provided.	2-2
5.	Classification of airspaces	2-2
6.	Performance-based navigation (PBN) operations	2-3
7.	Establishment and designation of the units providing air traffic services	2-3
8.	Specifications for control zones	2-3
9.	Identification of air traffic services units and airspaces	2-4
9A	Establishment and identification of significant points	2-4
10.	Establishment and identification of standard routes for taxiing aircraft	2-4
11.	Coordination between the operator and air traffic service	2-4
11A	Coordination of activities potentially hazardous to civil aircraft	2-4
11B	Aeronautical data	2-6
12.	Coordination between meteorological and air traffic services units	2-6
13.	Coordination between aeronautical information services and air traffic services units	2-7
14.	Minimum flight altitudes	2-7
15.	Service to aircraft in the event of an emergency	2-8
16.	In-flight contingencies	2-8

17.	Time in air traffic services	2-9
18.	Carriage and operation of pressure-altitude reporting transponders	2-10
19.	Safety management	2-10
20.	Common reference system	2-10
21.	Language proficiency	2-11
22.	Contingency arrangements	2-11
23.	Identification and delineation of prohibited, restricted and danger areas	2-11
Chapter 3	Air Traffic Control Service	3-1
1.	Application	3-1
2.	Provision of air traffic control service	3-1
3.	Operation of air traffic control service	3-1
4.	Separation minima	3-2
5.	Responsibility for control	3-3
6.	Transfer of responsibility for control	3-3
7.	Air traffic control clearances	3-4
8.	Control of persons and vehicles at aerodromes	3-6
9.	Provision of radar and ADS-B	3-7
10.	Use of surface movement radar (SMR)	3-7
Chapter 4	Flight Information Service	4-1
1.	Application	4-1
2.	Scope of flight information service	4-1
3.	Operational flight information service broadcasts	4-1
Chapter 5	Alerting Service	5-1
1.	Application	5-1
2.	Notification of rescue coordination centres	5-1
3.	Use of communication facilities	5-3
4.	Plotting aircraft in a state of emergency	5-3
5.	Information to the operator	5-3

6.	Information to aircraft operating in the vicinity of an aircraft in a state of emergency	.5-3
Chapter 6	Air Traffic Services Requirements For Communications	.6-1
1.	Aeronautical mobile service (air-ground communications)	.6-1
2.	Aeronautical fixed service (ground-ground communications)	.6-1
3.	Surface movement control service	.6-2
4.	Aeronautical radio navigation service	.6-3
Chapter 7	Air Traffic Services Requirements For Information	.7-1
1.	Meteorological information	.7-1
2.	Information on aerodrome conditions and the operational status of associated facilities	.7-2
3.	Information on the operational status of navigation services	.7-2
Appendix	1 A	1-1
Appendix	2A	12-1

Document	Change	History
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Issue	Revision	Date	Subject	Pages
				affected
1	0	15/02/2009	Initial issue	All
1	1	01/04/2012	-Establishment and Identification of Significant points	2-4
			-Safety Management	2-8
			-Principles Governing the	A3-1
			Establishment and Identification	
			of Significant Points	
1	2	01/11/2012	-Definition of Accident	1-1
			-Coordination of activities	2-4 & 2-5
			potentially hazardous to civil	
			aircraft	
			-Aeronautical data	2-6 & 2-7
			-Operational flight information	4-1
			service broadcasts	
			-Appendix 2 (Table 1)	A2-1
1	3	01/01/2014	-Definition	1-1
			-Integrity of aeronautical data	2-6
			-Safety management system	2-11
			-Identification and delineation of	2-11 & 12
			prohibited, restricted and danger	
			areas	
			-Aeronautical data quality	A2-1 & A2-2
			requirements	
1	4	01/05/2020	-Establishment and identification	2-4
			of significant points	
			-Aeronautical data	2-6
			-Coordination between	2-7
			aeronautical information services	
			and air traffic services units	
			-Principles governing the	A2-1 to A2-5
			establishment and identification	
			of significant points	
1	5	15/11/2020	-Coordination of activities	2-5 & 2-6
			potentially hazardous to civil	
				2.10
			-Safety management	2-10
			-Air traffic control clearances	3-3

Checklist of Pages

	Section	Page	Date
	Preface	ii	15/02/09
	Table of Contents	iii	01/05/20
	Table of Contents	iv	01/01/14
	Table of Contents	V	01/05/20
	Document Change History	vi	15/11/20
	Checklist of Pages	vii	15/11/20
•	Chapter 1	1-1	01/01/14
	Chapter 2	2-1	15/02/09
	Chapter 2	2-2	15/02/09
	Chapter 2	2-3	15/02/09
	Chapter 2	2-4	01/05/20
	Chapter 2	2-5	15/11/20
	Chapter 2	2-6	15/11/20
	Chapter 2	2-7	01/05/20
	Chapter 2	2-8	01/05/20
	Chapter 2	2-9	01/05/20
	Chapter 2	2-10	15/11/20
'	Chapter 2	2-11	01/05/20
	Chapter 2	2-12	01/05/20
	Chapter 3	3-1	15/02/09
	Chapter 3	3-2	15/02/09
	Chapter 3	3-3	15/02/09
	Chapter 3	3-4	15/02/09
	Chapter 3	3-5	15/11/20
-	Chapter 3	3-6	15/02/09
	Chapter 3	3-7	15/02/09
	Chapter 4	4-1	15/02/09
	Chapter 4	4-2	15/02/09
	Chapter 4	4-3	01/11/12
	Chapter 4	4-4	15/02/09
	Chapter 4	4-5	15/02/09
	Chapter 5	5-1	15/02/09
	Chapter 5	5-2	15/02/09
	Chapter 5	5-3	15/02/09
	Chapter 6	6-1	15/02/09
	Chapter 6	6-2	15/02/09

Section	Page	Data
Chapter 6	6.3	15/02/00
Chapter 7	7 1	15/02/09
Chapter 7	7-1	15/02/09
Annondiv 1	/-Z	15/02/09
Appendix 2	A1-1	13/02/09
Appendix 2	A2-1	01/03/20
Appendix 2	A2-2	01/03/20
Appendix 2	A2-3	01/03/20
Appendix 2	A2-4	01/05/20
Appendix 2	A2-3	01/05/20

Chapter 1 Definitions

- 1. The definitions of air traffic services terms are given in ICAO Annexes to the ICAO Chicago Convention and ICAO Documents unless otherwise specified.
- 2. Additional definitions are given in Air Navigation Regulation of Macao, as per amended.

Chapter 2 General

1. Objectives of the air traffic services

The objectives of the air traffic services shall be to:

- a) prevent collisions between aircraft;
- b) prevent collisions between aircraft on the manoeuvring area and obstructions on that area;
- c) expedite and maintain an orderly flow of air traffic;
- d) provide advice and information useful for the safe and efficient conduct of flights;
- e) notify appropriate organizations regarding aircraft in need of search and rescue aid, and assist such organizations as required.
- 2. Divisions of the air traffic services

The air traffic services shall comprise three services identified as follows.

- 2.1 The air traffic control service, to accomplish objectives a), b) and c) of 1, this service being divided in three parts as follows:
 - a) Area control service: the provision of air traffic control service for controlled flights, except for those parts of such flights described in 2.1 b) and c), in order to accomplish objectives a) and c) of 1.;
 - b) Approach control service: the provision of air traffic control service for those parts of controlled flights associated with arrival or departure, in order to accomplish objectives a) and c) of 1;
 - c) Aerodrome control service: the provision of air traffic control service for aerodrome traffic, except for those parts of flights described in 2.1 b), in order to accomplish objectives a), b) and c) of 1.
- 2.2 The flight information service, to accomplish objective d) of 1.
- 2.3 The alerting service, to accomplish objective e) of 1.
- 3. Determination of the need for air traffic services
- 3.1 The need for the provision of air traffic services shall be determined by consideration of the following:
 - a) the types of air traffic involved;
 - b) the density of air traffic;
 - c) the meteorological conditions;
 - d) such other factors as may be relevant.
- 3.2 The carriage of airborne collision avoidance systems (ACAS) by aircraft is not a factor in determining the need for air traffic services in Macao.

- 4. Designation of the portions of the airspace and controlled aerodromes where air traffic services will be provided
- 4.1 When it has been determined that air traffic services will be provided in particular portions of the airspace or at particular aerodromes, then those portions of the airspace or those aerodromes shall be designated in relation to the air traffic services that are to be provided.
- 4.2 The designation of the particular portions of the airspace or the particular aerodromes shall be as follows:
- 4.2.1 Flight information regions. Those portions of the airspace where it is determined that flight information service and alerting service will be provided shall be designated as flight information regions.
- 4.2.2 Control areas and control zones
- 4.2.2.1 Those portions of the airspace where it is determined that air traffic control service will be provided to IFR flights shall be designated as control areas or control zones.
- 4.2.2.1.1 Those portions of controlled airspace wherein it is determined that air traffic control service will also be provided to VFR flights shall be designated as Classes B, C, or D airspace.
- 4.2.2.2 Where designated within a flight information region, control areas and control zones shall form part of that flight information region.
- 4.2.3 Controlled aerodromes. Those aerodromes where it is determined that air traffic control service will be provided to aerodrome traffic shall be designated as controlled aerodromes.
- 5. Classification of airspaces
- 5.1 ATS airspaces shall be classified and designated in accordance with the following:
 - Class A. IFR flights only are permitted, all flights are provided with air traffic control service and are separated from each other.
 - Class B. IFR and VFR flights are permitted, all flights are provided with air traffic control service and are separated from each other.
 - Class C. IFR and VFR flights are permitted, all flights are provided with air traffic control service and IFR flights are separated from other IFR flights and from VFR flights. VFR flights are separated from IFR flights and receive traffic information in respect of other VFR flights.
 - Class D. IFR and VFR flights are permitted and all flights are provided with air traffic control service, IFR flights are separated from other IFR flights and receive traffic information in respect of VFR flights, VFR flights receive traffic information in respect of all other flights.
 - Class E. IFR and VFR flights are permitted, IFR flights are provided with air traffic control service and are separated from other IFR flights. All flights receive traffic information as far as is practical. Class E shall not be used for control zones.

- Class F. IFR and VFR flights are permitted, all participating IFR flights receive an air traffic advisory service and all flights receive flight information service if requested.
- Class G. IFR and VFR flights are permitted and receive flight information service if requested.
- 5.2 Airspace classes shall be selected appropriate to the needs.
- 5.3 The requirements for flights within each class of airspace shall be as shown in the table in Appendix 1.
- 6. Performance-based navigation (PBN) operations
- 6.1 In applying performance-based navigation, navigation specifications shall be prescribed. When applicable, the navigation specification(s) for designated areas, tracks or ATS routes shall be prescribed on the basis of regional air navigation agreements. In designating a navigation specification, limitations may apply as a result of navigation infrastructure constraints or specific navigation functionality requirements.
- 6.2 The prescribed navigation specification shall be appropriate to the level of communications, navigation and air traffic services provided in the airspace concerned.
- 7. Establishment and designation of the units providing air traffic services

Air traffic control units shall be established to provide air traffic control service, flight information service and alerting service within control areas, control zones and at controlled aerodromes.

- 8. Specifications for control zones
- 8.1 The delineation of airspace, wherein air traffic services are to be provided, should be related to the nature of the route structure and the need for efficient service rather than to national boundaries.
- 8.2 The lateral limits of control zones shall encompass at least those portions of the airspace, which are not within control areas, containing the paths of IFR flights arriving at and departing from aerodromes to be used under instrument meteorological conditions.
- 8.3 The lateral limits of a control zone shall extend to at least 9.3 km (5 NM) from the centre of the aerodrome or aerodromes concerned in the directions from which approaches may be made.
- 8.4 If a control zone is located within the lateral limits of a control area, it shall extend upwards from the surface of the earth to at least the lower limit of the control area.
- 8.5 If a control zone is located outside of the lateral limits of a control area, an upper limit should be established.
- 8.6 If it is desired to establish the upper limit of a control zone at a level higher than the lower limit of the control area established above it, or if the control zone is located outside of the lateral limits of a control area, its upper limit should be established at a level which can easily be identified by pilots.

- 9. Identification of air traffic services units and airspaces
- 9.1 An aerodrome control tower or approach control unit should be identified by the name of the aerodrome at which it is located.
- 9.2 A control zone, control area or flight information region should be identified by the name of the unit having jurisdiction over such airspace.
- 9A Establishment and identification of significant points
- 9A.1 Significant points shall be established for the purpose of defining an ATS route or instrument approach procedure and/or in relation to the requirements of air traffic services for information regarding the progress of aircraft in flight.
- 9A.2 Significant points shall be identified by designators.
- 9A.3 Significant points shall be established and identified in accordance with the principles set forth in Appendix 2.
- 10. Establishment and identification of standard routes for taxiing aircraft
- 10.1 Where necessary, standard routes for taxiing aircraft shall be established on an aerodrome between runways, aprons and maintenance areas. Such routes shall be direct, simple and where practicable, designed to avoid traffic conflicts.
- 10.2 Standards routes for taxiing aircraft shall be identified by designators distinctively different from those of the runways and ATS routes.
- 11. Coordination between the operator and air traffic service
- 11.1 Air traffic services units, in carrying out their objectives, shall have due regard for the requirements of operators consequent on their obligations as specified in the Air Navigation Regulation of Macao, and, if so required by the operators, shall make available to them or their designated representatives such information as may be available to enable them or their designated representatives to carry out their responsibilities.
- 11.2 When so requested by an operator, messages (including position reports) received by air traffic services units and relating to the operation of the aircraft for which operational control service is provided by that operator shall, so far as practicable, be made available immediately to the operator or a designated representative in accordance with locally agreed procedures.
- 11A Coordination of activities potentially hazardous to civil aircraft
- 11A.1 The arrangements for activities potentially hazardous to civil aircraft, whether over the territory of a State or over the high seas, shall be coordinated with the appropriate air traffic services authorities. The coordination shall be effected early enough to permit timely promulgation of information regarding the activities in accordance with

Procedures for Air Navigation Services — Aeronautical Information Management (PANS-AIM, Doc 10066).

- 11A.1.1 If the appropriate ATS authority is not that of the State where the organization planning the activities is located, initial coordination shall be effected through the ATS authority responsible for the airspace over the State where the organization is located.
- 11A.2 The objective of the coordination shall be to achieve the best arrangements which will avoid hazards to civil aircraft and minimize interference with the normal operations of such aircraft.
- 11A.2.1 In determining these arrangements the following shall be applied:
 - a) the locations or areas, times and durations for the activities shall be selected to avoid closure or realignment of established ATS routes, blocking of the most economic flight levels, or delays of scheduled aircraft operations, unless no other options exist;
 - b) the size of the airspace designated for the conduct of the activities shall be kept as small as possible;
 - c) direct communication between the appropriate ATS authority or air traffic services unit and the organization or unit conducting the activities shall be provided for use in the event that civil aircraft emergencies or other unforeseen circumstances require discontinuation of the activities.
- 11A.3 The appropriate ATS authority shall ensure that a safety risk assessment is conducted, as soon as practicable, for activities potentially hazardous to civil aircraft and that appropriate risk mitigation measures are implemented.

Note 1.— Such risk mitigation measures may include, but would not be limited to, airspace restriction or temporary withdrawal of established ATS routes or portions thereof.

Note 2.— Guidance on safety risk management can be found in the Safety Management Manual (SMM) (Doc 9859).

11A.3.1 Procedures shall be established to enable the organization or unit conducting or identifying activities potentially hazardous to civil aircraft to contribute to the safety risk assessment in order to facilitate consideration of all relevant safety-significant factors.

Note.— Guidance on collaborative decision making (CDM) processes for safety risk assessment and promulgation through NOTAM that could involve military authorities can be found in the Manual Concerning Safety Measures Relating to Military Activities Potentially Hazardous to Civil Aircraft Operations (Doc 9554).

- 11A.4 The appropriate ATS authorities shall be responsible for initiating the promulgation of information regarding the activities.
- 11A.5 If activities potentially hazardous to civil aircraft take place on a regular or continuing basis, special committees shall be established as required to ensure that the requirements of all parties concerned are adequately coordinated.
- 11A.6 Adequate steps shall be taken to prevent emission of laser beams from adversely affecting flight operations.

Note 1.— Guidance material regarding the hazardous effects of laser emitters on flight operations is contained in the Manual on Laser Emitters and Flight Safety (Doc 9815).

Note 2.— See also Annex 14 — Aerodromes, *Volume I —* Aerodrome Design and Operations, *Chapter 5.*

- 11A.7 In order to provide added airspace capacity and to improve efficiency and flexibility of aircraft operations, the procedures shall be established for a flexible use of airspace reserved for military or other special activities. The procedures shall permit all airspace users to have safe access to such reserved airspace.
- 11B Aeronautical data
- 11B.1 Determination and reporting of air traffic services-related aeronautical data shall be in accordance with the accuracy and integrity classification required to meet the needs of the end-user of aeronautical data.

Note.— Specifications concerning the accuracy and integrity classification of air traffic services-related aeronautical data are contained in PANS-AIM (Doc 10066), Appendix 1.

11B.2 Digital data error detection techniques shall be used during the transmission and/or storage of aeronautical data and digital data sets.

Note.— *Detailed specifications concerning digital data error detection techniques are contained in PANS-AIM (Doc 10066).*

- 12. Coordination between meteorological and air traffic services units
- 12.1 To ensure that aircraft receive the most up-to-date meteorological information for aircraft operations, arrangements shall be made, where necessary, between meteorological and air traffic services units for air traffic services personnel:
 - a) in addition to using indicating instruments, to report, if observed by air traffic services personnel or communicated by aircraft, such other meteorological elements as may be agreed upon;

- b) to report as soon as possible to the associated meteorological office meteorological phenomena of operational significance, if observed by air traffic services personnel or communicated by aircraft, which have not been included in the aerodrome meteorological report.
- 13. Coordination between aeronautical information services and air traffic services units
- 13.1 To ensure that aeronautical information services units obtain information to enable them to provide up-to-date pre-flight information and to meet the need for in-flight information, arrangements shall be made between aeronautical information services and air traffic services unit to report to the responsible aeronautical information services unit, with a minimum of delay:
 - a) information on aerodrome conditions;
 - b) the operational status of associated facilities, services and navigation aids within their area of responsibility;
 - c) any other information considered to be of operational significance.
- 13.2 Before introducing changes to the air navigation system, due account shall be taken by the services responsible for such changes of the time needed by the aeronautical information service for the preparation, production and issuance of relevant material for promulgation. To ensure timely provision of the information to the aeronautical information service, close coordination between those services concerned is therefore required.
- 13.3 Of particular importance are changes to aeronautical information that affect charts and/or computer-based navigation systems which qualify to be notified by the Aeronautical Information Regulation and Control (AIRAC) system, as specified in Annex 15 to the Chicago Convention, Chapter 6. The predetermined, internationally agreed AIRAC effective dates shall be observed by the responsible air traffic services when submitting the raw information/data to aeronautical information services.

Note.— Detailed specifications concerning the AIRAC system are contained in PANS-AIM (Doc 10066), Chapter 6.

13.4 The air traffic services responsible for the provision of raw aeronautical information/data to the aeronautical information services shall do so while taking into account accuracy and integrity requirements required to meet the needs of the end-user of aeronautical data.

Note 1.— Specifications concerning the accuracy and integrity classification of air traffic services-related aeronautical data are contained in PANS-AIM (Doc 10066), Appendix 1.

14. Minimum flight altitudes

Minimum flight altitudes shall be determined and promulgated for each ATS route and control area over the territory. The minimum flight altitudes determined shall provide a minimum clearance above the controlling obstacle located within the areas concerned.

- 15. Service to aircraft in the event of an emergency
- 15.1 An aircraft known or believed to be in a state of emergency, including being subjected to unlawful interference, shall be given maximum consideration, assistance and priority over other aircraft as may be necessitated by the circumstances. In communication between ATS units and aircraft in the event of an emergency, Human Factors principles shall be observed.
- 15.2 When an occurrence of unlawful interference with an aircraft takes place or is suspected, ATS units shall attend promptly to requests by the aircraft. Information pertinent to the safe conduct of the flight shall continue to be transmitted and necessary action shall be taken to expedite the conduct of all phrases of flight, especially the safe landing of the aircraft.
- 15.3 When an occurrence of unlawful interference with an aircraft takes place or is suspected, ATS units shall, in accordance with agreed procedures, immediately inform the appropriate authority and exchange necessary information with the operator or its designated representative.
- 16. In-flight contingencies
- 16.1 Strayed or unidentified aircraft

Note1. — *The terms "strayed aircraft" and "unidentified aircraft" in this paragraph have the following meanings:*

Strayed aircraft. An aircraft which has deviated significantly from its intended track or which reports that it is lost.

Unidentified aircraft. An aircraft which has been observed or reported to be operating in a given area but whose identity has not been established.

Note 2. — An aircraft may be considered, at the same time, as a "strayed aircraft" by one unit and as an "unidentified aircraft" by another unit.

Note 3. — A strayed or unidentified aircraft may be suspected as being the subject of unlawful interference.

- 16.1.1 As soon as an air traffic services unit becomes aware of a strayed aircraft it shall take all necessary steps as outlined in 16.1.1.1 and 16.1.1.2 to assist the aircraft and to safeguard its flight.
- 16.1.1.1 If the aircraft's position is not known, the air traffic services unit shall:
 - a) attempt to establish two-way communication with the aircraft, unless such communication already exists;
 - b) use all available means to determine its position;

- c) inform other ATS units into whose area the aircraft may have strayed or may tray, taking into account all the factors which may have affected the navigation of the aircraft in the circumstances;
- d) request from the units referred to in c) and from other aircraft in flight every assistance in establishing communication with the aircraft and determining its position.
- 16.1.1.2 When the aircraft's position is established, the air traffic services unit shall:
 - a) advise the aircraft of its position and corrective action to be taken; and
 - b) provide, as necessary, other ATS units with relevant information concerning the strayed aircraft and any advice given to that aircraft.
- 16.1.2 As soon as an air traffic services unit becomes aware of an unidentified aircraft in its area, it shall endeavor to establish the identity of the aircraft whenever this is necessary for the provision of air traffic services. To this end, the air traffic services unit shall take such of the following steps as are appropriate in the circumstances:
 - a) attempt to establish two-way communication with the aircraft;
 - b) inquire of other air traffic services units within the flight information region about the flight and request their assistance in establishing two-way communication with the aircraft;
 - c) inquire of air traffic services units serving the adjacent flight information regions about the flight and request their assistance in establishing two-way communication with the aircraft;
 - d) attempt to obtain information from other aircraft in the area.
- 16.1.3 Should the ATS unit consider that a strayed or unidentified aircraft may be the subject of unlawful interference, the appropriate authority shall immediately be informed, in accordance with agreed procedures.
- 16.2 Interception of civil aircraft
- 16.2.1 As soon as an air traffic services unit learns that an aircraft is being intercepted outside its area of responsibility, it shall take such of the following steps as are appropriate in the circumstances:
 - a) inform the ATS unit serving the airspace in which the interception is taking place, providing this unit with available information that will assist in identifying the aircraft and requesting it to take proper action;
 - b) relay message between the intercepted aircraft and the appropriate ATS unit or the intercepting aircraft.
- 17. Time in air traffic services
- 17.1 Air traffic services units shall use Coordinated Universal Time (UTC) and shall express the time in hours and minutes and, when required, seconds of the 24-hour day beginning at midnight.
- 17.2 Air traffic services units shall be equipped with clocks indicating the time in hours, minutes and seconds, clearly visible from each operating position in the unit concerned.
- 17.3 Air traffic services unit clocks and other time recording devices shall be checked as necessary to ensure correct time to within plus or minus 30 seconds of UTC. Wherever

data link communications are utilized by an air traffic services unit, clocks and other time-recording devices shall be checked as necessary to ensure correct time to within 1 second of UTC.

- 17.4 The correct time shall be obtained from a standard time station or, if not possible, from another unit which has obtained the correct time from such station.
- 17.5 Aerodrome control towers shall, prior to an aircraft taxiing for take-off, provide the pilot with the correct time, unless arrangements have been made for the pilot to obtain it from other sources. Air traffic services units shall, in addition, provide aircraft with the correct time on request. Time checks shall be given to the nearest half minute.
- 18. Carriage and operation of pressure-altitude reporting transponders

Carriage and operation of pressure-altitude reporting transponders within Macau Aerodrome Traffic Zone is required.

19. Safety management

Note — The general Macao Safety Management System Requirements are contained in Aeronautical Circular AC/GEN/005. Further guidance is contained in the Safety Management Manual (SMM) (Doc 9859) and associated procedures are contained in Aeronautical Circular AC/ATS/006.

- 19.1 Any significant safety-related change to the ATS system, including the implementation of a reduced separation minimum or a new procedure, shall only be effected after a safety risk assessment has demonstrated that an acceptable level of safety will be met and users have been consulted. When appropriate, the responsible authority shall ensure that adequate provision is made for post-implementation monitoring to verify that the defined level of safety continues to be met.
- 20. Common reference system
- 20.1 Horizontal reference system

World Geodetic System — 1984 (WGS-84) shall be used as the horizontal (geodetic) reference system for air navigation. Reported aeronautical geographical coordinates (indicating latitude and longitude) shall be expressed in terms of the WGS-84 geodetic reference datum.

- 20.2 Vertical reference system Mean sea level (MSL) datum, which gives the relationship of gravity-related height (elevation) to a surface known as the geoid, shall be used as the vertical reference system for air navigation.
- 20.3 Temporal reference system
- 20.3.1 The Gregorian calendar and Coordinated Universal Time (UTC) shall be used as the temporal reference system for air navigation.
- 20.3.2 When a different temporal reference system used, this shall be indicated in GEN 2.1.2 of the Aeronautical Information Publication (AIP).

21. Language proficiency

- 21.1 An air traffic services provider shall ensure that air traffic controllers speak and understand the language used for radiotelephony communications as specified in the Air Navigation Regulation of Macau.
- 21.2 Except when communications between air traffic control units are conducted in a mutually agreed language, the English language shall be used for such communications.
- 22. Contingency arrangements

Air traffic services units shall develop and promulgate contingency plans for implementation in the event of disruption, or potential disruption, of air traffic services and related supporting services in the airspace for which they are responsible for the provision of such services. Such contingency plans shall be developed with the assistance of ICAO as necessary, in close coordination with the air traffic services authorities responsible for the provision of services in adjacent portions of airspace and with airspace users concerned.

- 23. Identification and delineation of prohibited, restricted and danger areas
- 23.1 Each prohibited area, restricted area, or danger area being established shall, upon initial established, be given an identification and full details shall be promulgated.
 - a) Description, supplemented by graphic portrayal where appropriate, of prohibited, restricted and danger areas together with information regarding their establishment and activation, including:
 - 1) identification, name and geographical coordinates of the lateral limits in degrees, minutes and seconds if inside and in degrees and minutes if outside control area/control zone boundaries;
 - 2) upper and lower limits; and
 - 3) remarks, including time of activity.

Type of restriction or nature of hazard and risk of interception in the event of penetration must be indicated in the remarks column.

- 23.2 The identification so assigned shall be used to identify the area in all subsequent notifications pertaining to that area.
- 23.3 The identification shall be composed of a group of letters and figures as follows:
 - b) nationality letters for location indicators assigned to the State or territory which has establishment the airspace;
 - c) a letter P for prohibited area, R for restricted area and D for danger area as appropriate; and
 - d) a number, unduplicated within the State or territory concerned.

Note – Nationality letters are those contained in Location Indicators (Doc 7910).

23.4 To avoid confusion, identification numbers shall not be reused for a period of at least one year after cancellation of the area to which they refer.

ATS Requirements Issue 1. Rev. 4 (01/05/20)

23.5 When a prohibited, restricted or danger area is established, the area should be as small as practicable and be contained within simple geometrical limits, so as to permit ease of reference by all concerned.

Chapter 3 Air Traffic Control Service

1. Application

Air traffic control service shall be provided:

- a) to all IFR flights in airspace Classes A, B, C, D and E;
- b) to all VFR flights in airspace Classes B, C and D;
- c) to all special VFR flights;
- d) to all aerodrome traffic at controlled aerodromes.
- 2. Provision of air traffic control service

The parts of air traffic control service described in Chapter 2 2.1 shall be provided by the various units as follows:

- a) Area control service:
 - 1) by an area control centre; or
 - 2) by the unit providing approach control service in a control zone or in a control area of limited extent which is designated primarily for the provision of approach control service and where no area control centre is established.
- b) Approach control service:
 - by an aerodrome control tower or area control centre when it is necessary or desirable to combine under the responsibility of one unit the functions of the approach control service with those of the aerodrome control service or the area control service;
 - 2) by an approach control unit when it is necessary or desirable to establish a separate unit.
- c) Aerodrome control service: by an aerodrome control tower.
- 3. Operation of air traffic control service
- 3.1 In order to provide air traffic control service, the air traffic unit shall:
 - a) be provided with information on the intended movement of each aircraft, or variations therefrom, and with current information on the actual progress of each aircraft;
 - b) determine from the information received, the relative positions of known aircraft to each other;
 - c) issue clearances and information for the purpose of preventing collision between aircraft under its control and of expediting and maintaining an orderly flow of traffic;
 - d) coordinate clearances as necessary with other units:
 - 1) whenever an aircraft might otherwise conflict with traffic operated under the control of such other units;
 - 2) before transferring control of an aircraft to such other units.
- 3.2 Information on aircraft movements, together with a record of air traffic control clearances issued to such aircraft, shall be so displayed as to permit ready analysis in

order to maintain an efficient flow of air traffic with adequate separation between aircraft.

- 3.3 Air traffic control units should be equipped with devices that record background communication and the aural environment at air traffic controller work stations, capable of retaining the information recorded during at least the last twenty-four hours of operation.
- 3.4 Clearances issued by air traffic control units shall provide separation:
 - a) between all flights in airspace Classes A and B;
 - b) between IFR flights in airspace Classes C, D and E;
 - c) between IFR flights and VFR flights in airspace Class C;
 - d) between IFR flights and special VFR flights;
 - e) between special VFR flights when so prescribed by the appropriate ATS authority,

except that, when requested by an aircraft and if so prescribed by the appropriate ATS authority for the cases listed under b) above in airspace Classes D and E, a flight may be cleared without separation being so provided in respect of a specific portion of the flight conducted in visual meteorological conditions.

- 3.5 Separation by an air traffic control unit shall be obtained by at least one of the following:a) vertical separation, obtained by assigning different levels selected from:
 - 1) the appropriate table of cruising levels in Appendix 3 of Annex 2 to the Convention on International Civil Aviation, or
 - 2) a modified table of cruising levels, when so prescribed in accordance with Appendix 3 of Annex 2 to the Convention on International Civil Aviation for flight above FL 410,

except that the correlation of levels to track as prescribed therein shall not apply whenever otherwise indicated in appropriate aeronautical information publications or air traffic control clearances;

- b) horizontal separation, obtained by providing:
 - 1) longitudinal separation, by maintaining an interval between aircraft operating along the same, converging or reciprocal tracks, expressed in time or distance; or
 - 2) lateral separation, by maintaining aircraft on different routes or in different geographical areas;
- c) composite separation, consisting of a combination of vertical separation and one of the other forms of separation contained in b) above, using minima for each which may be lower than, but not less than half of, those used for each of the combined elements when applied individually. Composite separation shall only be applied on the basis of regional air navigation agreements.
- 4. Separation minima
- 4.1 The selection of separation minima for application within a given portion of airspace shall be as follows:
 - a) the separation minima shall be selected from those prescribed by the provisions of the ICAO PANS-ATM and the Regional Supplementary Procedures as applicable under the prevailing circumstances except that, where types of aids are used or circumstances prevail which are not covered by current ICAO provisions, other separation minima shall be established as necessary by:
 - 1) the appropriate ATS authority, following consultation with operators, for routes or portions of routes contained within Macao airspace;

- 2) regional air navigation agreements for routes or portions of routes contained within airspace over the high seas or over areas of undetermined sovereignty.
- b) the selection of separation minima shall be made in consultation between the appropriate ATS authorities responsible for the provision of air traffic services in neighbouring airspace when:
 - 1) traffic will pass from one into the other of the neighbouring airspaces;
 - 2) routes are closer to the common boundary of the neighbouring airspaces than the separation minima applicable in the circumstances.
- 4.2 Details of the selected separation minima and of their areas of application shall be notified:
 - a) to the ATS units concerned; and
 - b) to pilots and operators through aeronautical information publications, where separation is based on the use by aircraft of specified navigation aids or specified navigation techniques.
- 5. Responsibility for control
- 5.1 Responsibility for control of individual flightsA controlled flight shall be under the control of only one air traffic control unit at any given time.
- 5.2 Responsibility for control within a given block of airspace Responsibility for the control of all aircraft operating within a given block of airspace shall be vested in a single air traffic control unit. However, control of an aircraft or groups of aircraft may be delegated to other air traffic control units provided that coordination between all air traffic control units concerned is assured.
- 6. Transfer of responsibility for control
- 6.1 Place or time of transfer

The responsibility for the control of an aircraft shall be transferred from one air traffic control unit to another as follows:

- 6.1.1 Between a unit providing approach control service and an aerodrome control tower
- 6.1.1.1 Arriving aircraft. The responsibility for the control of an arriving aircraft shall be transferred from the unit providing approach control service to the aerodrome control tower, when the aircraft:
 - a) is in the vicinity of the aerodrome, and:
 - 1) it is considered that approach and landing will be completed in visual reference to the ground, or
 - 2) it has reached uninterrupted visual meteorological conditions, or
 - b) is at a prescribed point or level, as specified in letters of agreement or ATS unit instructions; or
 - c) has landed.
- 6.1.1.2 Departing aircraft. The responsibility for control of a departing aircraft shall be transferred from the aerodrome control tower to the unit providing approach control service:
 - a) when visual meteorological conditions prevail in the vicinity of the aerodrome:
 - 1) prior to the time the aircraft leaves the vicinity of the aerodrome, or
 - 2) prior to the aircraft entering instrument meteorological conditions, or
 - 3) at a prescribed point or level,

as specified in letters of agreement or ATS unit instructions;

- b) when instrument meteorological conditions prevail at the aerodrome:
 - 1) immediately after the aircraft is airborne, or
 - 2) at a prescribed point or level,
 - as specified in letters of agreement or ATS unit instructions.
- 6.1.2 Between control sectors/positions within the same air traffic control unit The responsibility for control of an aircraft shall be transferred from one control sector/position to another control sector/ position within the same air traffic control unit at a point, level or time, as specified in ATS unit instructions.
- 6.2 Coordination of transfer
- 6.2.1 Responsibility for control of an aircraft shall not be transferred from one air traffic control unit to another without the consent of the accepting control unit, which shall be obtained in accordance with 6.2.2 and 6.2.2.1, 6.2.2.2 and 6.2.3.
- 6.2.2 The transferring control unit shall communicate to the accepting control unit the appropriate parts of the current flight plan and any control information pertinent to the transfer requested.
- 6.2.2.1 Where transfer of control is to be effected using radar or ADS-B data, the control information pertinent to the transfer shall include information regarding the position and, if required, the track and speed of the aircraft, as observed by radar or ADS-B immediately prior to the transfer.
- 6.2.2.2 Where transfer of control is to be effected using ADS-C data, the control information pertinent to the transfer shall include the four-dimensional position and other information as necessary.
- 6.2.3 The accepting control unit shall:
 - a) indicate its ability to accept control of the aircraft on the terms specified by the transferring control unit, unless by prior agreement between the two units concerned, the absence of any such indication is understood to signify acceptance of the terms specified, or indicate any necessary changes thereto; and
 - b) specify any other information or clearance for a subsequent portion of the flight, which it requires the aircraft to have at the time of transfer.
- 6.2.4 The accepting control unit shall notify the transferring control unit when it has established two-way voice and/or data link communications with and assumed control of the aircraft concerned, unless otherwise specified by agreement between the two control units concerned.
- 6.2.5 Applicable coordination procedures, including transfer of control points, shall be specified in letters of agreement and ATS unit instructions as appropriate.
- 7. Air traffic control clearances

Air traffic control clearances shall be based solely on the requirements for providing air traffic control service.

- 7.1 Contents of clearances
- 7.1.1 An air traffic control clearance shall indicate:
 - a) aircraft identification as shown in the flight plan;
 - b) clearance limit;
 - c) route of flight;
 - d) level(s) of flight for the entire route or part thereof and changes of levels if required;

- e) any necessary instructions or information on other matters such as approach or departure manoeuvres, communications and the time of expiry of the clearance.
- 7.1.2 Standard departure and arrival routes and associated procedures should be established when necessary to facilitate:
 - a) the safe, orderly and expeditious flow of air traffic;
 - b) the description of the route and procedure in air traffic control clearances.
- 7.2 Read-back of clearances and safety-related information
- 7.2.1 The flight crew shall read back to the air traffic controller safety-related parts of ATC clearances and instructions which are transmitted by voice. The following items shall always be read back:
 - a) ATC route clearances;
 - b) clearances and instructions to enter, land on, take off from, hold short of, cross and backtrack on any runway; and
 - c) runway-in-use, altimeter settings, SSR codes, level instructions, heading and speed instructions and, whether issued by the controller or contained in ATIS broadcasts, transition levels.
- 7.2.1.1 Other clearances or instructions, including conditional clearances, shall be read back or acknowledged in a manner to clearly indicate that they have been understood and will be complied with.
- 7.2.1.2 The controller shall listen to the read-back to ascertain that the clearance or instruction has been correctly acknowledged by the flight crew and shall take immediate action to correct any discrepancies revealed by the read-back.
- 7.2.2 Unless specified by the ATS unit, voice read-back of CPDLC messages shall not be required.
- 7.2.3 Vehicle drivers operating or intending to operate on the manoeuvring area shall read back to the air traffic controller safety-related parts of instructions which are transmitted by voice, e.g. instructions to enter, hold short of, cross and operate on any operational runway or taxiway.
- 7.2.4 The controller shall listen to the read-back to ascertain that the instruction has been correctly acknowledged by the vehicle driver and shall take immediate action to correct any discrepancies revealed by the read-back.

7.3 Coordination of clearances

An air traffic control clearance shall be coordinated between air traffic control units to cover the entire route of an aircraft or a specified portion thereof as follows.

- 7.3.1 An aircraft shall be cleared for the entire route to the aerodrome of first intended landing:
 - a) when it has been possible, prior to departure, to coordinate the clearance between all the units under whose control the aircraft will come; or
 - b) when there is reasonable assurance that prior coordination will be effected between those units under whose control the aircraft will subsequently come.
- 7.3.2 When coordination as in 7.3.1 has not been achieved or is not anticipated, the aircraft shall be cleared only to that point where coordination is reasonably assured; prior to reaching such point, or at such point, the aircraft shall receive further clearance, holding instructions being issued as appropriate.
- 7.3.2.1 When prescribed by the ATC units, aircraft shall contact a downstream ATC unit, for the purpose of receiving a downstream clearance prior to the transfer of control point.
- 7.3.2.1.1 Aircraft shall maintain the necessary two-way communication with the current air traffic control unit whilst obtaining a downstream clearance.

- 7.3.2.1.2 A clearance issued as a downstream clearance shall be clearly identifiable as such to the pilot.
- 7.3.2.1.3 Unless coordinated, downstream clearances shall not affect the aircraft's original flight profile in any airspace, other than that of the air traffic control unit responsible for the delivery of the downstream clearance.
- 7.3.2.1.4 Where practicable, and where data link communications are used to facilitate downstream clearance delivery, two-way voice communications between the pilot and the air traffic control unit providing the downstream clearance should be available.
- 7.3.3 When an aircraft intends to depart from an aerodrome within a control area to enter another control area within a period of thirty minutes, or such other specific period of time as has been agreed between the area control centres concerned, coordination with the subsequent area control centre shall be effected prior to issuance of the departure clearance.
- 7.3.4 When an aircraft intends to leave a control area for flight outside controlled airspace, and will subsequently re-enter the same or another control area, a clearance from point of departure to the aerodrome of first intended landing may be issued. Such clearance or revisions thereto shall apply only to those portions of the flight conducted within controlled airspace.
- 7.4 Air traffic flow management
- 7.4.1 Air traffic flow management (ATFM) shall be implemented for airspace where air traffic demand at times exceeds, or is expected to exceed, the declared capacity of the air traffic control services concerned.
- 7.4.2 ATFM should be implemented on the basis of regional air navigation agreements or, if appropriate, through multilateral agreements. Such agreements should make provision for common procedures and common methods of capacity determination.
- 7.4.3 When it becomes apparent to an ATC unit that traffic additional to that already accepted cannot be accommodated within a given period of time at a particular location or in a particular area, or can only be accommodated at a given rate, that unit shall so advise the ATFM unit, when such is established, as well as, when appropriate, ATS units concerned. Flight crews of aircraft destined to the location or area in question and operators concerned shall also be advised of the delays expected or the restrictions that will be applied.
- 8. Control of persons and vehicles at aerodromes
- 8.1 The movement of persons or vehicles including towed aircraft on the manoeuvring area of an aerodrome shall be controlled by the aerodrome control tower as necessary to avoid hazard to them or to aircraft landing, taxiing or taking off.
- 8.2 In conditions where low visibility procedures are in operation:
 - a) persons and vehicles operating on the manoeuvring area of an aerodrome shall be restricted to the essential minimum, and particular regard shall be given to the requirements to protect the ILS/MLS sensitive area(s) when Category II or Category III precision instrument operations are in progress;
 - b) subject to the provisions in 8.3, the minimum separation between vehicles and taxiing aircraft shall be as prescribed by the ATC unit taking into account the aids available;
 - c) when mixed ILS and MLS Category II or Category III precision instrument operations are taking place to the same runway continuously, the more restrictive ILS or MLS critical and sensitive areas shall be protected.

- 8.3 Emergency vehicles proceeding to the assistance of an aircraft in distress shall be afforded priority over all other surface movement traffic.
- 8.4 Subject to the provisions in 8.3, vehicles on the manoeuvring area shall be required to comply with the following rules:
 - a) vehicles and vehicles towing aircraft shall give way to aircraft which are landing, taking off or taxiing;
 - b) vehicles shall give way to other vehicles towing aircraft;
 - c) vehicles shall give way to other vehicles in accordance with ATS unit instructions;
 - d) notwithstanding the provisions of a), b) and c), vehicles and vehicles towing aircraft shall comply with instructions issued by the aerodrome control tower.
- 9. Provision of radar and ADS-B

Radar and ADS-B ground systems should provide for the display of safety-related alerts and warnings, including conflict alert, conflict prediction, minimum safe altitude warning and unintentionally duplicated SSR codes.

10. Use of surface movement radar (SMR)

In the absence of visual observation of all or part of the manoeuvring area or to supplement visual observation, surface movement radar (SMR) provided in accordance with the provisions of Annex 14, Volume I, or other suitable surveillance equipment, should be utilized to:

- a) monitor the movement of aircraft and vehicles on the manoeuvring area;
- b) provide directional information to pilots and vehicle drivers as necessary; and
- c) provide advice and assistance for the safe and efficient movement of aircraft and vehicles on the manoeuvring area.

Chapter 4 Flight Information Service

- 1. Application
- 1.1 Flight information service shall be provided to all aircraft which are likely to be affected by the information and which are:
 - a) provided with air traffic control service; or
 - b) otherwise known to the relevant air traffic services units.
- 1.2 Where air traffic services units provide both flight information service and air traffic control service, the provision of air traffic control service shall have precedence over the provision of flight information service whenever the provision of air traffic control service so requires.
- 2. Scope of flight information service
- 2.1 Flight information service shall include the provision of pertinent:
 - a) SIGMET and AIRMET information;
 - b) information concerning pre-eruption volcanic activity, volcanic eruptions and volcanic ash clouds;
 - c) information concerning the release into the atmosphere of radioactive materials or toxic chemicals;
 - d) information on changes in the availability of radio navigation services;
 - e) information on changes in condition of aerodromes and associated facilities, including information on the state of the aerodrome movement areas when they are affected by snow, ice or significant depth of water;
 - f) information on unmanned free balloons;
 - and of any other information likely to affect safety.
- 2.2 Flight information service provided to flights shall include, in addition to that outlined in 2.1, the provision of information concerning:
 - a) weather conditions reported or forecast at departure, destination and alternate aerodromes;
 - b) collision hazards, to aircraft operating within Macao ATZ;
 - c) for flight over water areas, in so far as practicable and when requested by a pilot, any available information such as radio call sign, position, true track, speed, etc., of surface vessels in the area.
- 2.3 ATS units should transmit, as soon as practicable, special air-reports to other aircraft concerned, to the associated meteorological office, and to other ATS units concerned. Transmissions to aircraft should be continued for a period to be determined by agreement between the meteorological and air traffic services authorities concerned.
- 2.4 Flight information service provided to VFR flights shall include, in addition to that outlined in 2.1, the provision of available information concerning traffic and weather conditions along the route of flight that are likely to make operation under the visual flight rules impracticable.
- 3. Operational flight information service broadcasts
- 3.1 Application

- 3.1.1 The meteorological information and operational information concerning radio navigation services and aerodromes included in the flight information service shall, whenever available, be provided in an operationally integrated form.
- 3.1.2 Operational flight information service broadcasts, when provided, should consist of messages containing integrated information regarding selected operational and meteorological elements appropriate to the various phases of flight. These broadcasts should be of three major types, i.e. HF, VHF and ATIS.
- 3.1.3 When requested by the pilot, the applicable operational flight information service message(s) shall be transmitted by the appropriate ATS unit.
- 3.2 Voice-automatic terminal information service (Voice-ATIS) broadcasts
- 3.2.1 Voice-automatic terminal information service (Voice-ATIS) broadcasts shall be provided at aerodromes where there is a requirement to reduce the communication load on the ATS VHF air-ground communication channels. When provided, they shall comprise:
 - a) one broadcast serving arriving aircraft; or
 - b) one broadcast serving departing aircraft; or
 - c) one broadcast serving both arriving and departing aircraft; or
 - d) two broadcasts serving arriving and departing aircraft respectively at those aerodromes where the length of a broadcast serving both arriving and departing aircraft would be excessively long.
- 3.2.2 A discrete VHF frequency shall, whenever practicable, be used for Voice-ATIS broadcasts. If a discrete frequency is not available, the transmission may be made on the voice channel(s) of the most appropriate terminal navigation aid(s), preferably a VOR, provided the range and readability are adequate and the identification of the navigation aid is sequenced with the broadcast so that the latter is not obliterated.
- 3.2.3 Voice-ATIS broadcasts shall not be transmitted on the voice channel of an ILS.
- 3.2.4 Whenever Voice-ATIS is provided, the broadcast shall be continuous and repetitive.
- 3.2.5 The information contained in the current broadcast shall immediately be made known to the ATS unit(s) concerned with the provision to aircraft of information relating to approach, landing and take-off, whenever the message has not been prepared by that (those) unit(s).
- 3.2.6 Voice-ATIS broadcasts provided at designated aerodromes for use by international air services shall be available in the English language as a minimum.
- 3.2.7 Where Voice-ATIS broadcasts are available in more than one language, a discrete channel should be used for each language.
- 3.2.8 The Voice-ATIS broadcast message should, whenever practicable, not exceed 30 seconds, care being taken that the readability of the ATIS message is not impaired by the speed of the transmission or by the identification signal of a navigation aid used for transmission of ATIS. The ATIS broadcast message should take into consideration human performance.
- 3.3 Data link-automatic terminal information service (D-ATIS)
- 3.3.1 Where a D-ATIS supplements the existing availability of Voice-ATIS, the information shall be identical in both content and format to the applicable Voice-ATIS broadcast.
- 3.3.1.1 Where real-time meteorological information is included but the data remains within the parameters of the significant change criteria, the content, for the purpose of maintaining the same designator, shall be considered identical.
- 3.3.2 Where a D-ATIS supplements the existing availability of Voice-ATIS and the ATIS requires updating, Voice-ATIS and D-ATIS shall be updated simultaneously.
- 3.4 Automatic terminal information service (voice and/or data link)

- 3.4.1 Whenever Voice-ATIS and/or D-ATIS is provided:
 - a) the information communicated shall relate to a single aerodrome;
 - b) the information communicated shall be updated immediately a significant change occurs;
 - c) the preparation and dissemination of the ATIS message shall be the responsibility of the air traffic services;
 - d) individual ATIS messages shall be identified by a designator in the form of a letter of the ICAO spelling alphabet. Designators assigned to consecutive ATIS messages shall be in alphabetical order;
 - e) aircraft shall acknowl edge receipt of the information upon establishing communication with the ATS unit providing approach control service or the aerodrome control tower, as appropriate;
 - f) the appropriate ATS unit shall, when replying to the message in e) above or, in the case of arriving aircraft, at such other time as may be prescribed by the appropriate ATS authority, provide the aircraft with the current altimeter setting; and
 - g) the meteorological information shall be extracted from the local meteorological routine or special report.
- 3.4.2 When rapidly changing meteorological conditions make it inadvisable to include a weather report in the ATIS, the ATIS messages shall indicate that the relevant weather information will be given on initial contact with the appropriate ATS unit.
- 3.4.3 Information contained in a current ATIS, the receipt of which has been acknowledged by the aircraft concerned, need not be included in a directed transmission to the aircraft, with the exception of the altimeter setting, which shall be provided in accordance with 3.4.1 f).
- 3.4.4 If an aircraft acknowledges receipt of an ATIS that is no longer current, any element of information that needs updating shall be transmitted to the aircraft without delay.
- 3.4.5 Contents of ATIS should be kept as brief as possible. Information additional to that specified in 3.5 to 3.7, for example information already available in aeronautical information publications (AIPs) and NOTAM, should only be included when justified in exceptional circumstances.
- 3.5 ATIS for arriving and departing aircraft ATIS messages containing both arrival and departure information shall contain the following elements of information in the order listed:
 - a) name of aerodrome;
 - b) arrival and/or departure indicator;
 - c) contract type, if communication is via D-ATIS;
 - d) designator;
 - e) time of observation, if appropriate;
 - f) type of approach(es) to be expected;
 - g) the runway(s) in use; status of arresting system constituting a potential hazard, if any;
 - h) significant runway surface conditions and, if appropriate, braking action;
 - i) holding delay, if appropriate;
 - j) transition level, if applicable;
 - k) other essential operational information;
 - surface wind direction (in degrees magnetic) and speed, including significant variations and, if surface wind sensors related specifically to the sections of runway(s) in use are available and the information is required by operators, the

indication of the runway and the section of the runway to which the information refers;

- m) visibility and, when applicable, RVR and, if visibility/RVR sensors related specifically to the sections of runway(s) in use are available and the information is required by operators, the indication of the runway and the section of the runway to which the information refers;
- n) present weather;
- o) cloud below 1 500 m (5 000 ft) or below the highest minimum sector altitude, whichever is greater; cumulonimbus; if the sky is obscured, vertical visibility when available;
- p) air temperature;
- q) dew point temperature;
- r) altimeter setting(s);
- s) any available information on significant meteorological phenomena in the approach and climb-out areas including wind shear, and information on recent weather of operational significance;
- t) trend forecast, when available; and
- u) specific ATIS instructions.

Notes: items m), n) and o) are replaced by the term "CAVOK", whenever the conditions as specified in the AC/ATS006, Chapter 11 prevail.

3.6 ATIS for arriving aircraft

ATIS messages containing arrival information only shall contain the following elements of information in the order listed:

- a) name of aerodrome;
- b) arrival indicator;
- c) contract type, if communication is via D-ATIS;
- d) designator;
- e) time of observation, if appropriate;
- f) type of approach(es) to be expected;
- g) main landing runway(s); status of arresting system constituting a potential hazard, if any;
- h) significant runway surface conditions and, if appropriate, braking action;
- i) holding delay, if appropriate;
- j) transition level, if applicable;
- k) other essential operational information;
- surface wind direction (in degrees magnetic) and speed, including significant variations and, if surface wind sensors related specifically to the sections of runway(s) in use are available and the information is required by operators, the indication of the runway and the section of the runway to which the information refers;
- m) visibility and, when applicable, RVR and, if visibility/RVR sensors related specifically to the sections of runway(s) in use are available and the information is required by operators, the indication of the runway and the section of the runway to which the information refers;
- n) present weather;
- o) cloud below 1 500 m (5 000 ft) or below the highest minimum sector altitude, whichever is greater; cumulonimbus;
- p) if the sky is obscured, vertical visibility when available;

- q) air temperature;
- r) dew point temperature;
- s) altimeter setting(s);
- t) any available information on significant meteorological phenomena in the approach area including wind shear, and information on recent weather of operational significance;
- u) trend forecast, when available; and specific ATIS instructions.

Notes: items m), n) and o) are replaced by the term "CAVOK", whenever the conditions as specified in the AC/ATS006, Chapter 11 prevail.

3.7 ATIS for departing aircraft

ATIS messages containing departure information only shall contain the following elements of information in the order listed:

- a) name of aerodrome;
- b) departure indicator;
- c) contract type, if communication is via D-ATIS;
- d) designator;
- e) time of observation, if appropriate;
- f) runway(s) to be used for take-off; status of arresting system constituting a potential hazard, if any;
- g) significant surface conditions of runway(s) to be used for take-off and, if appropriate, braking action;
- h) departure delay, if appropriate;
- i) transition level, if applicable;
- j) other essential operational information;
- k) surface wind direction (in degrees magnetic) and speed, including significant variations and, if surface wind sensors related specifically to the sections of runway(s) in use are available and the information is required by operators, the indication of the runway and the section of the runway to which the information refers;
- visibility and, when applicable, RVR and, if visibility/RVR sensors related specifically to the sections of runway(s) in use are available and the information is required by operators, the indication of the runway and the section of the runway to which the information refers;
- m) present weather;
- n) cloud below 1 500 m (5 000 ft) or below the highest minimum sector altitude, whichever is greater; cumulonimbus; if the sky is obscured, vertical visibility when available;
- o) air temperature;
- p) dew point temperature;
- q) altimeter setting(s);
- r) any available information on significant meteorological phenomena in the climbout area including wind shear;
- s) trend forecast, when available; and
- t) specific ATIS instructions.

Notes: items 1), m), and n) are replaced by the term "CAVOK", whenever the conditions as specified in the AC/ATS006, Chapter 11 prevail.

Chapter 5 Alerting Service

- 1. Application
- 1.1 Alerting service shall be provided:
 - a) for all aircraft provided with air traffic control service;
 - b) in so far as practicable, to all other aircraft having filed a flight plan or otherwise known to the air traffic services; and
 - c) to any aircraft known or believed to be the subject of unlawful interference.
- 1.2 In the event of a state of emergency arising to an aircraft while it is under the control of an aerodrome control tower or approach control unit, such unit shall notify immediately the flight information centre or area control centre responsible which shall in turn notify the rescue coordination centre, except that notification of the area control centre, flight information centre, or rescue coordination centre shall not be required when the nature of the emergency is such that the notification would be superfluous.
- 1.2.1 Nevertheless, whenever the urgency of the situation so requires, the aerodrome control tower or approach control unit responsible shall first alert and take other necessary steps to set in motion all appropriate local rescue and emergency organizations which can give the immediate assistance required.
- 2. Notification of rescue coordination centres
- 2.1 Without prejudice to any other circumstances that may render such notification advisable, air traffic services units shall, except as prescribed in 5.1, notify rescue coordination centres immediately an aircraft is considered to be in a state of emergency in accordance with the following:
 - a) Uncertainty phase when:
 - 1) no communication has been received from an aircraft within a period of thirty minutes after the time a the time an unsuccessful attempt to establish communication with such aircraft was first made, whichever is the earlier, or when
 - 2) an aircraft fails to arrive within thirty minutes of the estimated time of arrival last notified to or estimated by air traffic services units, whichever is the later,

except when no doubt exists as to the safety of the aircraft and its occupants.

- b) Alert phase when:
 - 1) following the uncertainty phase, subsequent attempts to establish communication with the aircraft or inquiries to other relevant sources have failed to reveal any news of the aircraft, or when
 - 2) an aircraft has been cleared to land and fails to land within five minutes of the estimated time of landing and communication has not been reestablished with the aircraft, or when

3) information has been received which indicates that the operating efficiency of the aircraft has been impaired, but not to the extent that a forced landing is likely,

except when evidence exists that would allay apprehension as to the safety of the aircraft and its occupants, or when

- 4) an aircraft is known or believed to be the subject of unlawful interference.
- c) Distress phase when:
 - 1) following the alert phase, further unsuccessful attempts to establish communication with the aircraft and more widespread unsuccessful inquiries point to the probability that the aircraft is in distress, or when
 - 2) the fuel on board is considered to be exhausted, or to be insufficient to enable the aircraft to reach safety, or when
 - 3) information is received which indicates that the operating efficiency of the aircraft has been impaired to the extent that a forced landing is likely, or when
 - 4) information is received or it is reasonably certain that the aircraft is about to make or has made a forced landing,

except when there is reasonable certainty that the aircraft and its occupants are not threatened by grave and imminent danger and do not require immediate assistance.

- 2.2 The notification shall contain such of the following information as is available in the order listed:
 - a) INCERFA, ALERFA or DETRESFA, as appropriate to the phase of the emergency;
 - b) agency and person calling;
 - c) nature of the emergency;
 - d) significant information from the flight plan;
 - e) unit which made last contact, time and means used;
 - f) last position report and how determined;
 - g) colour and distinctive marks of aircraft;
 - h) dangerous goods carried as cargo;
 - i) any action taken by reporting office; and
 - j) other pertinent remarks.
- 2.2.1 Such part of the information specified in 2.2, which is not available at the time notification is made to a rescue coordination centre, should be sought by an air traffic services unit prior to the declaration of a distress phase, if there is reasonable certainty that this phase will eventuate.
- 2.3 Further to the notification in 2.1, the rescue coordination centre shall, without delay, be furnished with:
 - a) any useful additional information, especially on the development of the state of emergency through subsequent phases; or
 - b) information that the emergency situation no longer exists.

3. Use of communication facilities

Air traffic services units shall, as necessary, use all available communication facilities to endeavour to establish and maintain communication with an aircraft in a state of emergency, and to request news of the aircraft.

4. Plotting aircraft in a state of emergency

When a state of emergency is considered to exist, the flight of the aircraft involved shall be plotted on a chart in order to determine the probable future position of the aircraft and its maximum range of action from its last known position. The flights of other aircraft known to be operating in the vicinity of the aircraft involved shall also be plotted in order to determine their probable future positions and maximum endurance.

5. Information to the operator

- 5.1 When an area control or a flight information centre decides that an aircraft is in the uncertainty or the alert phase, it shall, when practicable, advise the operator prior to notifying the rescue coordination centre.
- 5.2 All information notified to the rescue coordination centre by an area control or flight information centre shall, whenever practicable, also be communicated, without delay, to the operator.
- 6. Information to aircraft operating in the vicinity of an aircraft in a state of emergency
- 6.1 When it has been established by an air traffic services unit that an aircraft is in a state of emergency, other aircraft known to be in the vicinity of the aircraft involved shall, except as provided in 6.2, be informed of the nature of the emergency as soon as practicable.
- 6.2 When an air traffic services unit knows or believes that an aircraft is being subjected to unlawful interference, no reference shall be made in ATS air-ground communications to the nature of the emergency unless it has first been referred to in communications from the aircraft involved and it is certain that such reference will not aggravate the situation.

Chapter 6 Air Traffic Services Requirements For Communications

- 1. Aeronautical mobile service (air-ground communications)
- 1.1 General
- 1.1.1 Radiotelephony and/or data link shall be used in air-ground communications for air traffic services purposes.
- 1.1.2 When direct pilot-controller two-way radiotelephony or data link communications are used for the provision of air traffic control service, recording facilities shall be provided on all such air-ground communication channels.
- 1.1.3 Recordings of communications channels as required in paragraph 1.1.1 shall be retained for a period of at least thirty days.
- 1.2 For flight information service
- 1.2.1 Air-ground communication facilities shall enable two-way communications to take place between a unit providing flight information service and appropriately equipped aircraft flying anywhere within the flight information region.
- 1.2.2 Whenever practicable, air ground communication facilities for flight information service should permit direct, rapid, continuous and static-free two-way communications.
- 1.3 For aerodrome control service
- 1.3.1 Air-ground communication facilities shall enable direct, rapid, continuous and staticfree two-way communications to take place between an aerodrome control tower and appropriately equipped aircraft operating at any distance within 45 km (25 NM) of the aerodrome concerned.
- 1.3.2 Where conditions warrant, separate communication channels should be provided for the control of traffic operating on the manoeuvring area.
- 2. Aeronautical fixed service (ground-ground communications)
- 2.1 General
- 2.1.1 Direct-speech and/or data link communications shall be used in ground-ground communications for air traffic services purposes.
- 2.2 Communications within a flight information region
- 2.2.1 An aerodrome control tower, in addition to being connected to the flight information centre, the area control centre and the approach control unit, shall have facilities for communications with the associated air traffic services reporting office, when separately established.
- 2.2.2 An aerodrome control tower shall have facilities for communications with the following units providing a service within their respective area of responsibility:
 - a) rescue and emergency services (including ambulance, fire, etc.);
 - b) the meteorological office serving the unit concerned;
 - c) the aeronautical telecommunications station serving the unit concerned;
 - d) the unit providing apron management service, when separately established.

- 2.2.3 Description of communication facilities
- 2.2.3.1 The communication facilities required under 2.2.1, 2.2.2 a) and b) shall include provisions for:
 - a) communications by direct speech alone, or in combination with data link communications, whereby for the purpose of transfer of control using radar or ADS-B, the communications can be established instantaneously and for other purposes the communications can normally be established within fifteen seconds; and
 - b) printed communications, when a written record is required; the message transit time for such communications being no longer than five minutes.
- 2.2.3.2 In all cases not covered by 2.2.3.1, the communication facilities should include provisions for:
 - a) communications by direct speech alone, or in combination with data link communications, whereby the communications can normally be established within fifteen seconds; and
 - b) printed communications, when a written record is required; the message transit time for such communications being no longer than five minutes.
- 2.2.3.3 In all cases where automatic transfer of data to and/or from air traffic services computers is required, suitable facilities for automatic recording shall be provided.
- 2.2.3.4 The communication facilities required in accordance with 2.2.1 and 2.2.2 should be supplemented, as and where necessary, by facilities for other forms of visual or audio communications, for example, closed circuit television or separate information processing systems.
- 2.2.3.5 The communication facilities required under 2.2.2 a) and b) shall include provisions for communications by direct speech arranged for conference communications.
- 2.2.3.6 The communication facilities required under 2.2.2 c) should include provisions for communications by direct speech arranged for conference communications, whereby the communications can normally be established within fifteen seconds.
- 2.2.3.7 All facilities for direct-speech or data link communications between air traffic services units and between air traffic services units and other units described under 2.2.2 shall be provided with automatic recording.
- 2.2.3.8 Recordings of data and communications as required in 2.2.3.3 and 2.2.3.7 shall be retained for a period of at least thirty days.
- 2.3 Procedures for direct-speech communications Appropriate procedures for direct speech communications should be developed to permit immediate connections to be made for very urgent calls concerning the safety of aircraft, and the interruption, if necessary, of less urgent calls in progress at the time.
- 3. Surface movement control service
- 3.1 Communications for the control of vehicles other than aircraft on manoeuvring areas at controlled aerodromes

- 3.1.1 Two-way radiotelephony communication facilities shall be provided for aerodrome control service for the control of vehicles on the manoeuvring area, except where communication by a system of visual signals is deemed to be adequate.
- 3.1.2 Where conditions warrant, separate communication channels shall be provided for the control of vehicles on the manoeuvring area. Automatic recording facilities shall be provided on all such channels.
- 3.1.3 Recordings of communications as required in 3.1.2 shall be retained for a period of at least thirty days.
- 4. Aeronautical radio navigation service
- 4.1 Automatic recording of surveillance data
- 4.1.1 Surveillance data from primary and secondary radar equipment or other systems (e.g. ADS-B, ADS-C), used as an aid to air traffic services, shall be automatically recorded for use in accident and incident investigations, search and rescue, air traffic control and surveillance systems evaluation and training.
- 4.1.2 Automatic recordings shall be retained for a period of at least thirty days. When the recordings are pertinent to accident and incident investigations, they shall be retained for longer periods until it is evident that they will no longer be required.

Chapter 7Air Traffic Services Requirements For Information

- 1. Meteorological information
- 1.1 General
- 1.1.1 Air traffic services units shall be supplied with up-to-date information on existing and forecast meteorological conditions as necessary for the performance of their respective functions. The information shall be supplied in such a form as to require a minimum of interpretation on the part of air traffic services personnel and with a frequency which satisfies the requirements of the air traffic services units concerned.
- 1.1.2 Air traffic services units should be supplied with available detailed information on the location, vertical extent, direction and rate of movement of meteorological phenomena in the vicinity of the aerodrome, and particularly in the climb-out and approach areas, which could be hazardous to aircraft operations.
- 1.1.3 When computer-processed upper air data are made available to air traffic services units in digital form for use by air traffic services computers, the contents, format and transmission arrangements should be as agreed between the Meteorological Authority and the appropriate ATS Authority.
- 1.2 Aerodrome control towers
- 1.2.1 Aerodrome control towers shall be supplied with meteorological information as described in Annex 3, Appendix 9, 1.1 for the aerodrome with which they are concerned. Special reports and amendments to forecasts shall be communicated to the aerodrome control towers as soon as they are necessary in accordance with established criteria, without waiting for the next routine report or forecast.
- 1.2.2 Aerodrome control towers shall be provided with current pressure data for setting altimeters for the aerodrome concerned.
- 1.2.3 Aerodrome control towers shall be equipped with surface wind display(s). The display(s) shall be related to the same location(s) of observation and be fed from the same sensor(s) as the corresponding display(s) in the meteorological station, where such a station exists. Where multiple sensor(s) are used, the displays to which they are related shall be clearly marked to identify the runway and section of the runway monitored by each sensor.
- 1.2.4 Aerodrome control towers at aerodromes where runway visual range values are measured by instrumental means shall be equipped with display(s) permitting read-out of the current runway visual range value(s). The display(s) shall be related to the same location(s) of observation and be fed from the same sensor(s) as the corresponding display(s) in the meteorological station, where such a station exists.
- 1.2.5 Aerodrome control towers at aerodromes where the height of cloud base is assessed by instrumental means should be equipped with display(s) permitting read-out of the current value(s) of the height of cloud base. The displays should be related to the same location(s) of observations and be fed from the same sensor(s) as the corresponding display(s) in the meteorological station, where such a station exists.

- 1.2.6 Aerodrome control towers shall be supplied with information on wind shear which could adversely affect aircraft on the approach or take-off paths or during circling approach and aircraft on the runway during the landing roll or take-off run.
- 1.2.7 Aerodrome control towers and/or other appropriate units should be supplied with aerodrome warnings.
- 1.3 Communication stations

Where necessary for flight information purposes, current meteorological reports and forecasts shall be supplied to communication stations. A copy of such information shall be forwarded to the flight information centre or the area control centre.

2. Information on aerodrome conditions and the operational status of associated facilities

Aerodrome control towers and units providing approach control service shall be kept currently informed of the operationally significant conditions of the movement area, including the existence of temporary hazards, and the operational status of any associated facilities at the aerodrome(s) with which they are concerned.

- 3. Information on the operational status of navigation services
- 3.1 ATS units shall be kept currently informed of the operational status of radio navigation services and visual aids essential for take-off, departure, approach and landing procedures within their area of responsibility and those radio navigation services and visual aids essential for surface movement.
- 3.2 Information on the operational status, and any changes thereto, of radio navigation services and visual aids as referred to in 3.1 should be received by the appropriate ATS unit(s) on a timely basis consistent with the use of the service(s) and aid(s) involved.

Appendix 1

ATS airspace classes – services provided and flight requirements

Class	Type of flight	Separation provided	Service provided	Speed limitation*	Radio communication requirement	Subject to an ATC clearance		
Α	IFR only	All aircraft	Air traffic control service	Not applicable	Continuous two-way	Yes		
В	IFR	All aircraft	Air traffic control service	Not applicable	Continuous two-way	Yes		
	VFR	All aircraft	Air traffic control service	Not applicable	Continuous two-way	Yes		
С	IFR	IFR from IFR IFR from VFR	Air traffic control service	Not applicable	Continuous two-way	Yes		
	VFR	VFR from IFR	 Air traffic control service for separation from IFR; VFR/VFR traffic information (and traffic avoidance advice on request) 	250kt IAS below 3050 m (10000 ft) AMSL	Continuous two-way	Yes		
D	IFR	IFR from IFR	Air traffic control service, traffic information about VFR flights (and traffic avoidance advice on request)	250kt IAS below 3050 m (10000 ft) AMSL	Continuous two-way	Yes		
	VFR	Nil	IFR/VFR and VFR/VFR traffic information (and traffic avoidance advice on request)	250kt IAS below 3050 m (10000 ft) AMSL	Continuous two-way	Yes		
Е	IFR	IFR from IFR	Air traffic control service and, as far as practical, traffic information about VFR flights	250kt IAS below 3050 m (10000 ft) AMSL	Continuous two-way	Yes		
	VFR	Nil	Traffic information as far as practical	250kt IAS below 3050 m (10000 ft) AMSL	No	No		
F	IFR	IFR from IFR as far as practical	Air traffic advisory service; flight information service	250kt IAS below 3050 m (10000 ft) AMSL	Continuous two-way	No		
	VFR	Nil	Flight information service	250kt IAS below 3050 m (10000 ft) AMSL	No	No		
G	IFR	Nil	Flight information service	250kt IAS below 3050 m (10000 ft) AMSL	Continuous two-way	No		
	VFR	Nil	Flight information service	250kt IAS below 3050 m (10000 ft) AMSL	No	No		
*When the height of the transition altitude is lower than 3050 m (10000 ft) AMSL, FL100 should be used in lieu of 10000 ft.								

Appendix 2

PRINCIPLES GOVERNING THE ESTABLISHMENT AND IDENTIFICATION OF SIGNIFICANT POINTS

(See Chapter 2, 9A refers)

1. Establishment of significant points

- 1.1 Significant points should, whenever possible, be established with reference to groundbased radio navigation aids, preferably VHF or higher frequency aids.
- 1.2 Where such ground-based radio navigation aids do not exist, significant points shall be established at locations which can be determined by self-contained airborne navigation aids, or, where navigation by visual reference to the ground is to be effected, by visual observation. Specific points may be designated as "transfer of control" points by agreement between adjacent air traffic control units or control positions concerned.

2. Designators for significant points marked by the site of

a radio navigation aid

2.1 Plain language name for significant points marked by

the site of a radio navigation aid

- 2.1.1 Whenever practicable, significant points shall be named with reference to an identifiable and preferably prominent geographical location.
- 2.1.2 In selecting a name for the significant point, care shall be taken to ensure that the following conditions are met:
 - a) the name shall not create difficulties in pronunciation for pilots or ATS personnel when speaking in the language used in ATS communications. Where the name of a geographical location in the national language selected for designating a significant point gives rise to difficulties in pronunciation, an abbreviated or contracted version of this name, which retains as much of its geographical significance as possible, shall be selected;

Example: FUERSTENFELDBRUCK = FURSTY

- b) the name shall be easily recognizable in voice communications and shall be free of ambiguity with those of other significant points in the same general area. In addition, the name shall not create confusion with respect to other communications exchanged between air traffic services and pilots;
- c) the name should, if possible, consist of at least six letters and form two syllables and preferably not more than three;

- d) the selected name shall be the same for both the significant point and the radio navigation aid marking it.
 - 2.2 Composition of coded designators for significant points

marked by the site of a radio navigation aid

- 2.2.1 The coded designator shall be the same as the radio identification of the radio navigation aid. It shall be so composed, if possible, as to facilitate association with the name of the point in plain language.
- 2.2.2 Coded designators shall not be duplicated within 1 100 km (600 NM) of the location of the radio navigation aid concerned, except as noted hereunder.

Note.— When two radio navigation aids operating in different bands of the frequency spectrum are situated at the same location, their radio identifications are normally the same.

2.3 The requirements for coded designators shall be notified through AACM to the Regional Offices of ICAO for coordination.

3. Designators for significant points not marked by the site of

a radio navigation aid

3.1 Where a significant point is required at a position not marked by the site of a radio navigation aid, and is used for ATC purposes, it shall be designated by a unique five-letter pronounceable "name-code" This name-code designator then serves as the name as well as the coded designator of the significant point.

Note.— The principles governing the use of alphanumeric name-codes in support of RNAV SIDs, STARs and instrument approach procedures are detailed in PANS-OPS (Doc 8168).

3.2 The name-code designator shall be selected so as to avoid any difficulties in pronunciation by pilots or ATS personnel when speaking in the language used in ATS communications.

Examples: ADOLA, KODAP

3.3 The name-code designator shall be easily recognizable in voice communications and shall be free of ambiguity with those used for other significant points in the same general area.

- 3.4 The unique five-letter pronounceable name-code designator assigned to a significant point shall not be assigned to any other significant point. When there is a need to relocate a significant point, a new name-code designator shall be chosen. In cases when a State wishes to keep the allocation of specific name-codes for reuse at a different location, such name-codes shall not be used until after a period of at least six months.
- 3.5 The requirements for unique five-letter pronounceable name-code designators shall be notified through AACM to the Regional Offices of ICAO for coordination.
- 3.6 In areas where no system of fixed routes is established or where the routes followed by aircraft vary depending on operational considerations, significant points shall be determined and reported in terms of World Geodetic System 1984 (WGS-84) geographical coordinates, except that permanently established significant points serving as exit and/or entry points into such areas shall be designated in accordance with the applicable provisions in 2 or 3.

4. Use of designators in communications

- 4.1 Normally the name selected in accordance with 2 or 3 shall be used to refer to the significant point in voice communications. If the plain language name for a significant point marked by the site of a radio navigation aid selected in accordance with 2.1 is not used, it shall be replaced by the coded designator which, in voice communications, shall be spoken in accordance with the ICAO spelling alphabet.
- 4.2 In printed and coded communications, only the coded designator or the selected name-code shall be used to refer to a significant point.

5. Significant points used for reporting purposes

- 5.1 In order to permit ATS to obtain information regarding the progress of aircraft in flight, selected significant points may need to be designated as reporting points.
- 5.2 In establishing such points, consideration shall be given to the following factors:
 - a) the type of air traffic services provided;
 - b) the amount of traffic normally encountered;
 - c) the accuracy with which aircraft are capable of adhering to the current flight plan;
 - d) the speed of the aircraft;
 - e) the separation minima applied;

- f) the complexity of the airspace structure;
- g) the control method(s) employed;
- h) the start or end of significant phases of a flight (climb, descent, change of direction, etc.);
- i) transfer of control procedures;
- j) safety and search and rescue aspects;
- k) the cockpit and air-ground communication workload.
- 5.3 Reporting points shall be established either as "compulsory" or as "on-request".
- 5.4 In establishing "compulsory" reporting points the following principles shall apply:
 - a) compulsory reporting points shall be limited to the minimum necessary for the routine provision of information to air traffic services units on the progress of aircraft in flight, bearing in mind the need to keep cockpit and controller workload and air-ground communications load to a minimum;
 - b) the availability of a radio navigation aid at a location should not necessarily determine its designation as a compulsory reporting point;
 - c) compulsory reporting points should not necessarily be established at flight information region or control area boundaries.
- 5.5 "On-request" reporting points may be established in relation to the requirements of air traffic services for additional position reports when traffic conditions so demand.
- 5.6 The designation of compulsory and on-request reporting points shall be reviewed regularly with a view to keeping the requirements for routine position reporting to the minimum necessary to ensure efficient air traffic services.
- 5.7 Routine reporting over compulsory reporting points should not systematically be made mandatory for all flights in all circumstances. In applying this principle, particular attention shall be given to the following:
 - a) high-speed, high-flying aircraft should not be required to make routine position reports over all reporting points established as compulsory for low-speed, lowflying aircraft;
 - b) aircraft transiting through a terminal control area should not be required to make routine position reports as frequently as arriving and departing aircraft.

5.8 In areas where the above principles regarding the establishment of reporting points would not be practicable, a reporting system with reference to meridians of longitude or parallels of latitude expressed in whole degrees may be established.